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AUTHOR Schunk, Dale H.
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ABSTRACT

The self-regulation of attributions, beliefs concerning the causes of outcomes, is explored. An increasing body of research substantiates the idea that effective self-regulation depends on forming positive attributions that promote perceptions of competence and sustain motivation directed toward learning. Self-regulation refers to the process by which learners direct their cognitions, motivation, and behaviors toward the attainment of their academic goals. Social cognitive theory postulates three important processes in self-regulation: self-observation, self-judgment, and self-reaction. Learners observe their task progress, judge its acceptability, and react by sustaining action or altering strategies. Effective self-regulation depends on holding an optimal sense of self-efficacy (perceived competence) for learning and on making attributions (perceived causes of outcomes) that enhance self-efficacy and motivation. Research is reviewed that demonstrates positive effects of attributions and attributional feedback on self-regulation and that highlights important causal and correlational processes among attributions and achievement outcomes. Implications for teaching practice and future research suggestions are discussed. (Contains 33 references.) (Author/SLD)

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**Development of Strategic Competence
Through Self-Regulation of Attributions**

Dale H. Schunk
School of Education
Purdue University

Presented at the annual meeting of the American
Psychological Association, New York, August 1995.

Correspondence should be addressed to: Dale H. Schunk, 1446

LAEB Room 5108, Purdue University, West Lafayette, IN

47907-1446.

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Abstract

Self-regulation refers to the process whereby learners direct their cognitions, motivation, and behaviors, toward the attainment of their academic goals. Social cognitive theory postulates three important processes in self-regulation: self-observation, self-judgment, self-reaction. Learners observe their task progress, judge its acceptability, and react by sustaining action or altering strategies. Effective self-regulation depends on holding an optimal sense of self-efficacy (perceived competence) for learning, and on making attributions (perceived causes of outcomes) that enhance self-efficacy and motivation. Research is reviewed that demonstrates positive effects of attributions and attributional feedback on self-regulation, and that highlights important causal and correlational processes among attributions and achievement outcomes. Implications for teaching practice and future research suggestions are discussed.

**Development of Strategic Competence
Through Self-Regulation of Attributions**

A topic assuming increasing educational importance is learners' self-regulation of their cognitions, motivation, and behaviors, which are oriented toward the attainment of academic goals and promote achievement (Zimmerman, 1989, 1990, 1994). Self-regulation includes such activities as: attending to and concentrating on instruction; organizing, coding, and rehearsing information to be remembered; establishing a productive work environment; using resources effectively; holding positive beliefs about one's capabilities, the value of learning, the factors influencing learning, and the anticipated outcomes of actions; and experiencing pride and satisfaction with one's efforts (Schunk, 1989).

Effective self-regulation requires that students have goals and the motivation to attain them (Bandura, 1986; Zimmerman, 1989). Students must regulate not only their actions but also their underlying achievement-related cognitions, beliefs, intentions, and affects. This view of self-regulation fits well with research showing that students are mentally active during learning rather than being passive recipients of information, and exert a large degree of control over attainment of their goals (Pintrich & Schrauben, 1992).

In this paper I focus on the self-regulation of attributions, of beliefs concerning the causes of outcomes (Weiner, 1992). An increasing body of research substantiates the idea that effective self-regulation depends on forming positive attributions that promote perceptions of competence and sustain motivation directed toward learning (Schunk, 1994).

Theoretical Background

Social Cognitive Theory of Self-Regulation

The conceptual focus of this paper is social cognitive theory, which views self-regulation as comprising three processes: self-observation, self-judgment, self-reaction (Bandura, 1986; Kanfer & Gaelick, 1986). Self-observation (or self-monitoring) is deliberate attention to aspects of one's behavior. Self-observation is necessary but by itself insufficient for sustained self-regulation. A second process is self-judgment, which refers to comparing present performance with one's goal. Such comparisons inform one of goal progress and can exert motivational effects on future performance. Self-reactions to goal progress may be evaluative or tangible. Evaluative reactions involve beliefs about progress. The belief that one is making progress, along with the anticipated satisfaction of goal attainment, enhances self-efficacy and sustains motivation. People also may react in a tangible fashion to perceived progress (e.g., buying something they want, taking a night off from studying). The anticipated consequences of

behavior rather than the consequences themselves boost motivation (Bandura, 1986).

At the start of learning activities students have such goals as acquiring skills and knowledge, finishing work, and making good grades. As they work, students observe, judge, and react to their perceptions of goal progress. These self-regulatory processes interact with one another. As students observe aspects of their behavior they judge them against standards and react positively or negatively. Their evaluations and reactions set the stage for additional observations of the same behaviors or of others. These processes also interact with the environment (Zimmerman, 1989). Students who judge their learning progress as inadequate may react by asking for teacher assistance. In turn, teachers may teach students a more efficient strategy, which students then use to foster learning.

Self-Efficacy

Effective self-regulation depends on students developing a sense of self-efficacy for learning and performing well. Self-efficacy refers to personal beliefs about one's capabilities to learn or perform skills at designated levels (Bandura, 1986). Self-efficacy is hypothesized to influence choice of activities, effort expended, persistence, and achievement. Compared with students who doubt their learning capabilities, those with high self-efficacy for accomplishing a task participate more

readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level.

Learners acquire information to appraise their self-efficacy from their performance accomplishments, vicarious (observational) experiences, forms of persuasion, and physiological reactions (Schunk, 1989). Information acquired from these sources does not influence self-efficacy automatically but rather is cognitively appraised (Bandura, 1986). Learners weigh and combine the contributions of such factors as perceptions of their ability, task difficulty, amount of effort expended, amount and type of assistance received from others, similarity to models, and persuader credibility (Schunk, 1989).

Effective self-regulation depends on holding an optimal sense of self-efficacy for learning (Bandura, 1986; Bouffard-Bouchard, Parent, & Larivee, 1991; Zimmerman, 1989). Students who feel efficacious about learning choose to engage in tasks, select effective strategies, expend effort, and persist when difficulties are encountered (Bandura, 1991; Schunk, 1991; Zimmerman, 1989). As students work on a task they compare their performances to their goals. Self-evaluations of progress enhance self-efficacy and keep students motivated to improve.

Attributions

Attribution theory originated with Heider's (1958) naive analysis of action, which examines how ordinary people view the causes of important events. Guided by Heider's

work, Weiner (1979, 1985, 1992; Weiner et al., 1971) formulated an attributional theory of achievement behavior. This theory postulates that students attribute their successes and failures to such factors as ability, effort, task ease or difficulty, and luck. Weiner did not state that these were the only attributions given by students--there are others such as help from others and illness--but these four are commonly perceived as causes of achievement outcomes. Attributions are given general weights, and for any given outcome one or two factors will be perceived as primarily responsible. For example, a student who fails a math exam might attribute it to low ability ("I'm not good at math") and to low effort ("I didn't study much for the test").

Causes can be represented along three dimensions: internal or external to the person, relatively stable or unstable over time, and controllable or uncontrollable by the individual. Ability generally is viewed as internal, stable, and uncontrollable; effort as internal, unstable, and controllable. Students use situational cues to form attributions. For ability, salient cues are success attained easily or early in the course of learning, and many successes. Effort cues are physical or mental exertion, and persisting for a lengthy period. Task ease/difficulty cues include task features (e.g., length of math problem or passage to read), along with social norms (whether other students perform well or poorly). Luck cues are random

outcomes and lack of relation between what one's actions and outcomes (e.g., playing a slot machine).

Attributions are hypothesized to affect students' expectations, motivation, and emotions (Weiner, 1992). Stability influences expectancy of success. Assuming that task conditions remain much the same, success ascribed to stable causes (high ability, low task difficulty) results in higher expectancies of success (self-efficacy) than does attributing it to unstable causes (effort, luck). Locus influences affective reactions. Learners experience greater pride/shame after succeeding/failing when outcomes are attributed to internal causes rather than to external ones. Controllability has diverse effects. Feelings of control increase one's choice of academic tasks, effort, persistence, and achievement (Bandura, 1986). The perceptions of little control over outcomes negatively affects expectations, motivation, and emotions (Licht & Kistner, 1986).

Self-Regulation of Attributions

Effective self-regulation depends on holding an optimal sense of self-efficacy for learning (Bandura, 1986; Bouffard-Bouchard, Parent, & Larivee, 1991; Zimmerman, 1989). As students work on a task they compare their performances to their goals. Self-evaluations of progress enhance self-efficacy and keep students motivated to improve.

Although low self-efficacy is detrimental, effective self-regulation does not require that self-efficacy be extremely high. Salomon (1984) found that lower self-efficacy led to greater mental effort and better learning than when self-efficacy was higher. Assuming that learners feel efficacious enough to surmount difficulties, harboring some doubt about whether one will succeed may mobilize effort and effective use of strategies better than will feeling overly confident.

Effective self-regulation depends on students making attributions that enhance self-efficacy and motivation. Attributions enter into self-regulation during the self-judgment and self-reaction stages when students compare and evaluate their performances (Schunk, 1994). Whether goal progress is judged acceptable depends on its attribution. Students who attribute success to factors over which they have little control, such as luck or task ease, may hold a low sense of self-efficacy if they believe they probably cannot succeed on their own. If they think that they lack the ability to perform well, they may judge learning progress as deficient and be unmotivated to work harder. Students who attribute success to a combination of ability, effort, and strategy use, should experience higher self-efficacy and remain motivated to work diligently.

Research Evidence

In this section I review some research that investigates self-efficacy and attributions in achievement

settings. Most attributional research has not been primarily directed toward exploring how students self-regulate attributions but rather has examined the influences on attributions and their effects on achievement outcomes.

I briefly discuss evidence from two sources: studies investigating attributional feedback and self-regulation, and research exploring causal and correlational processes among attributions and achievement outcomes.

Attributional Feedback and Self-Regulation

Evidence bearing on self-efficacy and attributions stems from studies in which investigators attempt to modify learners' attributions and achievement outcomes by providing feedback linking their successes or failures with one or more attributions. These attributional feedback studies show that such feedback changes students' attributions (e.g., Andrews & Debus, 1978; Carr & Borkowski, 1989; Dweck, 1975); however, many did not explore how feedback exerts its effects or assess self-efficacy. There also are studies in which attributions were not assessed but which show that attributional feedback influences self-efficacy (Schunk, 1982; Schunk & Gunn, 1985).

A series of studies demonstrates that attributional feedback affects students' attributions and self-efficacy (Schunk, 1983, 1984; Schunk & Cox, 1986; Schunk & Rice, 1986). Schunk (1983) is a representative study. Children who lacked subtraction skills received instruction and self-directed practice solving problems over sessions. Children

were assigned randomly to one of four feedback conditions: ability, effort, ability plus effort, none. During the problem solving, ability-feedback children periodically received verbal feedback linking their successful problem solving with ability (e.g., "You're good at this"), effort-feedback subjects received effort statements ("You've been working hard"), ability-plus-effort students received both forms of feedback, and no-feedback students did not receive attributional feedback. Self-efficacy and subtraction skill were assessed following the last instructional session. Children also judged the amount of effort they expended during the sessions, which, although not a pure attributional measure, reflects the extent that children believed their successes were due to effort.

Ability feedback promoted self-efficacy and skill more than did effort feedback, ability-plus-effort feedback, and no feedback. The effort and ability-plus-effort conditions outperformed the no-feedback group. Compared with the no-feedback condition, the other three conditions displayed greater self-regulated learning (problem solving during self-directed practice). The effort and ability-plus-effort conditions judged effort expenditure greater than the ability group, who judged effort higher than the no-feedback condition. It appears that the ability-plus-effort group discounted some ability information; they might have wondered how good they really were since they were informed that they were working hard to succeed.

Other evidence that attributions relate to self-regulated learning comes from a study by Schunk and Cox (1986), who provided subtraction instruction with practice to students with learning disabilities. Children received either effort feedback during the first half of the instructional program, during the second half of the program, or no effort feedback. The results showed that effort feedback enhanced self-efficacy, skill, and problem solving during independent practice time (which required application of self-regulatory strategies), more than no effort feedback. Effort feedback led to higher effort attributions than no feedback; further, students who received effort feedback during the first half of the instructional program judged effort to be a more important cause of success than subjects who received feedback during the second half.

The role of attributions in the regulation of strategy use was studied by Schunk and Rice (1986), who provided children with reading difficulties with instruction and practice in identifying important ideas. One condition (ability-ability) periodically received ability feedback for their successful comprehension, a second condition (effort-effort) received effort feedback, a third condition (ability-effort) was given ability feedback during the first half of the instructional program and effort feedback during the second half, and for a fourth condition (effort-ability) this sequence was reversed. Self-regulatory processes were

involved because children were taught a comprehension strategy and were largely on their own during the sessions to apply it.

The four conditions did not differ in comprehension skill acquisition but ability-ability and effort-ability students judged self-efficacy higher following instruction than did students in the effort-effort and ability-effort conditions. Children who received ability feedback during the second half of the instructional program placed greater emphasis on ability as a cause of success than children who received effort feedback during the second half. Ability-effort students made higher effort attributions than did ability-ability children.

Other attributional feedback studies show different patterns of attributions as being more effective; for example, Schunk (1984) found that early ability feedback was more effective than later feedback. These between-study differences are difficult to resolve given that studies differ in content, type of subjects, and number and format of instructional sessions. These differences notwithstanding, it is clear that attributional feedback is related to students' self-regulated use of strategies in learning contexts.

Research by Relich, Debus, and Walker (1986) explored the link between attributional feedback for successes and failures and achievement outcomes. The feedback stressed effort and ability (e.g., "That's incorrect; I know you have

the ability but you just have to try harder"). Relative to a control condition, students who received feedback displayed higher self-efficacy and skill, less attribution of failure to low ability, and greater emphasis on effort as a cause of outcomes.

Other research in which attributional feedback was not provided shows that self-efficacy and attributions are important self-regulatory components. Butkowsky and Willows (1980) found that relative to poor readers, good and average readers hold higher expectancies for success, persist longer on tasks, are less likely to attribute failure to internal and stable causes (e.g., low ability), and more likely to attribute success to ability. Poor readers also show the greatest decline in expectancy of success following failure. Collins (1982) examined children's self-efficacy for solving mathematical word problems. Children were classified as high, average, or low ability. Regardless of ability group, high-efficacy students chose to rework more problems they missed than did low-efficacy students. The latter also reported lower ratings for their ability relative to that of peers than did high-efficacy students. High-efficacy children were more likely than low-efficacy students to attribute failure to low effort.

This research is promising and strongly suggests that the acquisition of strategic competence during learning is aided by the self-regulation of attributions. A challenge for future research is to explore in greater depth how

students maintain effective attributional beliefs as they encounter difficulties and obstacles in learning. Such research also might illuminate the process whereby students self-regulate attributions and how attributions change as they develop skills in a content area.

Causal and Correlational Processes

Research has examined the relation of self-efficacy and attributions to each other and to achievement outcomes. Many studies have obtained significant and positive correlations between measures of perceived self-efficacy and skillful performance (Schunk, 1994). Most studies also have obtained positive correlations between ability attributions and self-efficacy. Schunk and Cox (1986) found a positive relation between effort attributions for success and self-efficacy. Self-efficacy also correlates positively with attributions of success to task ease and negatively with attributions to luck (Schunk & Gunn, 1986). Relich et al. (1986) found that a measure that emphasized effort as a cause of outcomes and de-emphasized ability as a cause of failure correlated positively with self-efficacy and achievement.

Research shows that achievement correlates positively with attributions to ability, effort, and task ease (Schunk, 1994). Schunk (1984) found a negative correlation between achievement and luck attributions. Schunk and Cox (1986) obtained a positive correlation between ability and effort attributions for success.

Schunk and Gunn (1986) explored through regression and causal analysis the influences on children's achievement outcomes. Children received instruction in long division and engaged in self-regulated learning and problem solving. During part of the sessions children verbalized aloud while solving problems. Verbalizations were categorized as reflecting effective or ineffective problem-solving strategies, depending on whether they would lead to accurate solutions. Attributions for successful problem solving, self-efficacy, and skill, were assessed.

The largest direct influence on changes in students' division skill was due to use of effective strategies, but skill also was strongly affected by self-efficacy and effort attributions. Ability attributions for success exerted the strongest influence on self-efficacy, which suggests that instruction affects self-efficacy in part through the intervening influence of attributions. Luck attributions had a negative impact on self-efficacy. Taken together, these results show that the use of effective task strategies during self-regulated learning enhances skills, and that students maintaining positive attributional beliefs stressing ability and effort for success raise their efficacy beliefs and skillful performance.

Relich et al. (1986) explored the effects of attributional feedback on attributions, self-efficacy, and achievement, as well as the relations among attributions, efficacy, and achievement. Attributional feedback exerted a

direct effect on attributions, self-efficacy, and achievement; attributions influenced self-efficacy, and efficacy had a direct effect on achievement. Feedback affected achievement directly and indirectly through its effects on attributions and self-efficacy. The effect of attributions on achievement was weak; thus, the primary effect of attributions on achievement may occur through self-efficacy.

Implications for Practice

The preceding theory and research findings have implications for classroom teaching to enhance students' self-regulation. One suggestion is to ensure that attributional feedback to students is credible. The attributions stressed to students must match their perceptions of the factors contributing to their performances. Thus, students who have to work hard to succeed may reject feedback that highlights their high ability in the content area; conversely, those who succeed easily will not believe feedback attributing performance to hard work. When feedback stresses two or more attributions (e.g., ability and effort for success), students may assess their credibility, accept the most credible and discount the least credible. This situation is common in school where teachers may emphasize ability and effort, but unless students perceive both as responsible they are apt to reject one of them.

Similarly, as students seek to hold positive attributions during self-regulatory learning it is necessary for the feedback they acquire to support these. They need a process whereby they can evaluate the credibility of their attributions. For example, if students believe that effort and strategy use are contributing to performance, they need to periodically assess their level of effort and how strategy use is affecting their performance. Such self-evaluative opportunities may need to be built into the normal instructional program.

A related recommendation relates to the self-regulation process. In order for students to regulate their achievement beliefs, which include attributions and self-efficacy, they need to perform the self-regulatory processes of self-observation, self-judgment, and self-reaction. Students initially may need to be taught to engage in these processes since they likely are not used to doing so. They may have to learn how to self-monitor their performances and their efficacy and attributional beliefs, to judge whether performances are acceptable and whether their beliefs match that performance level, and to react by deciding to continue as they are or to make strategic changes that may enhance their performance, efficacy, and attributions.

There is recent research in which students were trained in one or more of these self-regulatory processes, which then were systematically incorporated into an instructional program (Sawyer, Graham, & Harris, 1992; Schunk & Swartz,

1993). In addition, models constitute an important source of efficacy and attributional information. Teachers can have models portray strategic behaviors and verbalize statements stressing such factors as efficacy for learning or performing well and attributions for success to ability, effort, or strategy use. The modeled statements can be included as part of a program designed to teach self-observation and self-evaluation. During the actual instruction, students can be cued at various times to make observations (e.g., record their progress), and periodic self-evaluations of efficacy and attributions can be scheduled.

In summary, self-efficacy and attributions are important self-regulatory processes during academic activities. There is substantial theory and research showing that the development of competence in academic domains depends in part on regulating one's beliefs such that one feels efficacious about learning and holds positive beliefs concerning the causes of learning. Future research can explore methods for teaching self-regulatory skills and the mechanisms whereby students regulate their efficacy and attributional beliefs to maintain their motivation and increase their skills.

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